Developing Video Guides and revamping experiment with student shapers

Dr Manjula Silva, Dr Mark Oxborrow, Laura Lain, Jiyu Jiang, Louis Kang
Agenda

- Motivation for the partnership
- What was done?
- What were the main outputs?
- What were the challenges?
- What are the benefits to students/student experience?
- What are the longer-term outcomes?
- How could these outcomes and benefits be valuable or translated to other parts of the College?
- Recommendations
“We are really glad that we took part in this scheme. We feel a lot more connected to the department, to the staff and we liked being able to have a (hopefully) positive impact. We had never worked so closely with staff members, and think it was a great learning experience”
Need for the project

Figure 1: amplitude-modulated (AM) radio signal

Figure 4: Demodulated signal (with the use of a homemade galena diode)
Motivation to work with StudentShapers

Student feedback

Previous year experience of working with a student

First year and second year student reps' feedback

Curriculum review
What were the main outputs?

• Four video guides were made to show operating the instruments and making measurements out of it.

• Redesigned first year experiment by converting it to two parts of a new experiment. Developed and tried out the part one of the experiment.
What was done?

- Discussed the need for this project, how students learn and expectations. Shared ideas/ thoughts, met regularly.

- Met with TFs from Aeronautical Eng., met other students who were doing similar work, watched videos made by others.

- Met with e-learning hub team for guidance for making videos. We have also done the planning, making script, filming, voice recording, and editing, conducted experiments as a team.
Development of the Video Guides

- Identifying the areas of difficulty for students
  - Survey
- Reading literature/discussions on length of videos
- Writing a storyline
- Getting the storyline checked
- Filming
- Audio Recording
- Editing
### Charpy Testing Clip

**07-10-2019**

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>0</td>
<td>No sound</td>
<td>Still of the charpy testing machine in a distance. Title pop up in the middle of the screen.</td>
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<tr>
<td></td>
<td>The Charpy impact test, also known as the Charpy V-notch test, is a standardized high strain-rate test which determines the amount of energy absorbed by a material during fracture. This absorbed energy is a measure of a given material's toughness...</td>
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<td>... and acts as a tool to study temperature-dependent ductile-brittle transition.</td>
<td>Still of ductile-brittle transition graph</td>
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<td>Safety information must be read before carrying out the test.</td>
<td>Still of the safety instruction.</td>
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<tr>
<td>1</td>
<td>To begin, lift the pendulum/hammer up counter clockwise...</td>
<td>Overview of a person lifting up the hammer up with two hands, cutoff when the pendulum reaches top position.</td>
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<td>...until you go past the lock point, indicated by a metallic click. Bring the hammer gently to rest against this stop point.</td>
<td>Close up at the top of the testing machine.</td>
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4 Video Guides
Charpy Impact Testing Guide
Department of Materials - Imperial College London
Crystal Radio Experiment
Crystal Radio Experiment: What Should Change?

Part 1

- I-V curve measurement of diodes
  - No prior knowledge for 1st-year students

Part 2

- Point contact diode construction
  - Hard to achieve
- Observe rectification
  - Again, no prior knowledge
Crystal Radio Experiment: Change into what?

Part 1

- I-V curve measurement of diodes
- Point contact diode construction
- Observe rectification

Part 2

- Measurement of other materials (conductors, thermistors)
- Construction of a filter circuit
- Using the filter circuit to find a radio signal
Crystal Radio Experiment: How to achieve?

- Construction of a filter circuit
- Using the filter circuit to find a radio signal
Crystal Radio Experiment: How to achieve?

1. Building The Filter

- High-pass filter
- Low-pass filter
- Band-pass filter
Crystal Radio Experiment: How to achieve?

2. To Solder Or Not To Solder
So much stuff to do
But on schedule so far
Problem accumulates
Differences in what to do
Just solve the solvable would be great
The method of producing an experiment has been achieved.

The experiment, though half-finished, is on track to its completion.

Made me more resilient in coping with unexpected difficulties on both technical and communicational terms.
Student Shapers

Identified challenges:

- Students' independence in planning and timing
- Uncertainties /departmental delays
- Identifying how to contribute to the partnership
- Students unsure about expected knowledge and skills of 1st years
- Students' fear to contribute equally
- Students' uncertainty in planning and timing
What are the longer-term outcomes & benefits to student learning/student experience?

• Targeted at enhancing the laboratory skills. Longer term impact - it helps develop technology-enhanced learning in an active learning environment.

• The video guides help to learn, make learning more accessible to students and help diverse student community and the practice of inclusivity in the department.

• Having agency on developing teaching activities have a longer-term impact on students shapers such as a sense of belonging to their learning environment and taking responsibility for their own learning.
How could these outcomes and benefits be valuable/translated to other parts of the College?

- Collaborations between departments - allow students/staff from other departments to work collaboratively on common themes.

- Can be extended to enhance the safety in the labs by making video guides. (consideration for next year)

- Can be translated to other parts of the College to broaden studentshapers as UG school ambassadors (developing similar materials, experimental kits for the purpose of supporting schools in STEM subjects)

- Feasibility of developing a new teaching avenue, where studentshapers can work with staff in developing teaching under module names.
Recommendations

- Give more time for student shapers to engage and work
- Understand the varied expectations, standards of working between students and staff.
- Communication – regular discussions with students, clarify expectations
- Be firm on the requirements (Different requirements by many staff members may cause confusion among students)
- Support to ease tensions in the team
- Feedback to be embedded in the planning process
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Questions?